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ing the day. The research has, however, developed the remarkable fact that when leaves become covered with dew the radiation is the same for all, being that of a dew surface, and is much less than the radiation of naked leaves, being only 62.7 per cent. of lampblacked surfaces. This is one of the causes that has contributed in no small degree to make coal so abundant upon the earth.

NESTING OF THE PIED-BILLED GREBE.

BY A. M. COLLETTE, EMPORIA.

The pied-billed grebe (*Podilymbus podiceps*) is known to every boy who ever shouldered a gun and wandered along our creeks and rivers by some of the following names: Thick-billed grebe, Carolina grebe, dabchick, dipper, water-witch, devil-diver, or hell-diver.

It is a common summer resident in our State, and very abundant in migration, arriving the last of April and remaining until late in the fall.

These birds (like all the family) are noted for their wonderful power of diving and swimming. I think it would be safe to say that in a minute's time they can dive 300 or 400 feet.

Colonel Goss, in his "History of the Birds of Kansas," says: "Some writers hold that these birds do not use their wings under water. This may be so; but I am inclined to think, when out of the rushes and with nothing to catch or tangle, they use them to accelerate their speed."

They do not often take to wing, relying more on their power of swimming and diving as a means of escape; and it is almost impossible to force them to leave the water, but when in the air, fly with great rapidity, with neck and feet stretched out to their full extent.

About their breeding places they are very shy, and, when approached, will cover their eggs and slip quietly away, thus leading a great many ornithologists to believe that these birds do not occupy their nests during the day, but cover them with decaying vegetation and the eggs are kept warm by the artificial heat from this material.

The doubt that existed in my mind with regard to this has been entirely eradicated. A good opportunity offered itself this summer to watch their nidification and I took advantage of it.

On a large pond, about three miles from Emporia, covered with rushes and other aquatic plants, these birds are found in great abundance. They were first observed nesting here by V. L. Kellogg, of the State University, in 1885, at which time he procured a number of sets. It might be interesting to add that they have never nested here since until this summer, when I took about 20 nests.

The nests are composed of decaying reeds, rushes, and grass, mixed with a debris brought up from the bottom. This structure is fastened to the flags and reeds, making a floating island of decaying material a few inches above the water, upon which a small nest is built.

Two of the nests that I found were located in some small aquatic plants a short distance from the bank, in about three feet of water, and from a tree on the bank the eggs could be distinctly seen.

From this tree I could watch the birds without being seen by them, and during all the time I watched them I never saw them leave the nest unless disturbed, and

then they would always quickly cover their eggs, glide under the water without a ripple, come up at a sufficient distance from me, and make a kind of cackling noise, but would soon return by diving and coming up among the weeds, near the nest, as soon as alone.

Mr. O. Davie, author of "Nests and Eggs of N. A. Birds," claims that the birds cover the eggs during the day and sit on them during the night, never going near the nest in the daytime. Mr. Geo. Cantrell says that he has noticed that where the sets are complete, the eggs are covered with vegetable matter and incomplete sets are found uncovered, and the deeper the eggs are imbedded in the refuse matter the more incubated they are, a fresh set just having a thin layer over them. He accounts for this by saying the layer first put on loses its heat after a time and more is put on to keep up the necessary heat. He gives this merely as a theory which will not stand, as facts are what we want.

Mr. William Smith, observing their nesting in Colorado, says that he took a number of sets that retained their natural color, owing to the nest being built of living grass, although plenty of decaying material was close at hand. This alone would upset the decaying theory. The habit of covering the eggs while off the nest is for the purpose of concealing them from their common enemy, such as hawks, etc., and not for the artificial heat from the decaying vegetation.

They begin laying about May 10. The number of eggs laid by this species ranges from 3 to 10—the complement is usually five. The eggs, when fresh, are white, with a slight bluish shade, but soon become stained in their wet bed. A nest of 10, in the collection at the State Normal, measure: 1.75×1.20 , 1.87×1.21 , 1.80×1.20 , 1.76×1.21 , 1.78×1.22 , 1.80×1.22 , 1.83×1.23 , 1.80×1.20 , 1.76×1.22 , 1.74×1.20 , but the average size is 1.72×1.17 .

LIST OF PLANTS COLLECTED BY THE GARFIELD UNIVERSITY EXPEDITION OF 1889.

BY M. A. CARLETON, MANHATTAN.

The plants named in this list were collected in the summer of 1889 by a party sent out by the Garfield University, composed of the following persons: N. D. Laughlin, C. C. Willson, Robert Rogers, and the writer, in charge. Most of the species were obtained in the Rocky Mountain region, from Colorado to the head waters of the Missouri river, but a few were collected on the plains of eastern Colorado.

For aid in the identification of species, I am very much indebted to Pres. J. M. Coulter, of Indiana State University, who named a great majority of them. Prof. L. H. Bailey named the carices, and Prof. W. A. Kellerman and W. T. Swingle identified some of the fungi. Other species I have determined myself. The species are arranged in their natural orders—the phanerogams according to Luerssen—and sufficient citations given to facilitate references to their descriptions, with the addition of occasional notes of interest. When no citations are given, descriptions are readily found in Coulter's "Manual of Rocky Mountain Botany."

Specimens of all the species, with possibly three or four exceptions, are to be found in the Garfield University herbarium, and in my own herbarium. Many of them are also in the herbaria of the Kansas Agricultural College and Indiana State University.

All the specimens from Limon, Colo. (a station on the Rock Island railroad about 150 miles from the east line of the State), were collected in the first week of